

tris subtiliter punctatis, subpubescentibus, fuscis; antennis pedibusque rufo-flavis.

Long. corp. $\frac{4}{5}$ lin., lat. $\frac{2}{5}$ lin.

This minute species varies somewhat in size and also in colour: one example before me is of a deep-black colour, the thorax being somewhat fuscous; this same example is perceptibly smaller in size. In the absence of any series of specimens, I can detect no necessarily permanent difference which would constitute it a distinct species. *H. adumbratus* is less distinctly punctured than *H. Emilianus*; it is, moreover, easily recognized by its manifest pubescence.

Three examples were taken by M. Truqui in Mexico. In the cabinets of Mr. Fry and the Rev. Hamlet Clark.

b. *Thoracis striola in elytris haud continuata.*

16. *H. apicatus*, n. sp.

H. breviter ovatus, apice attenuatus, subrotundatus, modice depressus, glaber, punctatus; capite flavo; thorace ad basin subtilissime punctato, rufo-flavo aut flavo; elytris crebre punctatis, rufo-ferrugineis; pedibus antennisque flavis.

Long. $\frac{3}{5}$ — $\frac{4}{5}$ lin., lat. $\frac{2}{5}$ lin.

This pretty minute species resembles in size and coloration *H. convexus*, Aubé (= *Desmopachria nitida*, Bab., Trans. Ent. Soc. Lond. iii. p. 16), of Brazil: it is, however, an entirely different species; the basal striæ of the thorax place it in a different section of the genus; it is more acuminate at the apex, and not so globose; the punctuation of the elytra is much more distinct than in *H. convexus*. In form it approaches *H. granarius* of Aubé.

A single example has been kindly communicated to me by M. Deyrolle of Paris, received by him from "Teapa," Mexico.

XIX.—*Descriptions of Indian and Burmese Species of the Genus Unio, Retz.* By W. H. BENSON, Esq.

HAVING collected specimens of the genus *Unio* in Bengal, Bahar, the Doab, Oude, Rohilkhund, Bundelkhund, and other parts of the Gangetic region, from Calcutta to Delhi and the base of the Himalayan range, and having received others from correspondents who have kindly transmitted the productions of tracts which I had no opportunity of visiting during the years of my residence in India, I have procured a series of the species, inhabiting the waters of that country, which no other collector is likely to have had opportunities for obtaining.

Considering the mode in which the species of this difficult genus approach each other in their variations, I undertake the

task of describing the following shells with diffidence, although confident that my observations will help to increase our knowledge of the genus, even if one or two forms should eventually be decided to be varieties. I have not quite exhausted my store of novelties, and am, moreover, inclined to believe that some of the shells which I still regard as varieties would be pronounced to be distinct species by some writers who have studied the genus more extensively.

The remarks published by Lamarck on the subject are worthy of note. He says: "Ce qui se montre dans tous les genres où nos collections se sont bien enrichies, savoir, que les espèces se nuancent et se fondent les unes dans les autres, dans le cours de leurs variations, se fait ici encore plus fortement remarquer qu'ailleurs, et confirme ce que j'ai dit de l'espèce dans ma 'Philosophie Zoologique' et autres ouvrages; aussi la détermination des espèces du genre *Mulette* est-elle très-difficile."

I add some notes on species already published, and which have fallen under my observation.

1. *Unio Jenkinsianus*, B., n. sp.

U. testa transverse elongata, subacuminato-ovata, valde inæquilaterali, tumida, crassa, antice brevi rotundata, postice elongata, minime alata, superne sensim descendente, demum angusta, obtusa; margine basali antice convexiusculo, postice subrecto; ligamento brevi; disco valde tumido, transverse plicato; epidermide picea, versus marginem ventralem olivacea; umbonibus leviter convexis, decor-ticatis, apicibus obtusis; dentibus arcuatim sitis, crassiusculis, erosis, cardinalibus elongatiusculis, valvæ sinistrae subsimplicibus, dextrae duplicibus laminatis, lateralibus remotis subelongatis, valvæ sinistrae duplicibus, lamina interna demum incrassata: margarita violaceo-albida, iridescente.

Long. 52, lat. 94, diam. 38 mill.

Habitat in fluvio Assamensi Berhampooter dicto.

The anterior cicatrices are widely separated, the posterior confluent, and in the right valve a distinct cicatrix is placed in the angle formed by the confluent portions. The dorsal cicatrices are situated between the shallow cavity of the beaks and the cardinal tooth. The subapical lobe of the cardinal tooth in the right valve is obsolete, the other somewhat thickened, oblique, and erect. In the left valve the cardinal tooth is double and oblique, the internal portion being thickened. The lateral teeth are oblique, erose, and rather short, especially the double one in the left valve, in which the lower lamina is very thick, especially towards the extremity. The ligamental slope is flattened, not alate as in *U. marginalis*, and the ligament is very short when compared with that of the different varieties of the latter species.

The very tumid form, the sloping posterior end, the absence

of a wing, the short ligament, and the nature and position of the teeth, all concur in warranting the separation of this shell from *U. marginalis*, a small variety of which was sent to me from the Berhampooter River by Major Rowlatt.

I am indebted to Colonel Jenkins for the species here described, as well as for the types of the Assamese forms *U. involutus*, *U. Corbis*, *U. Radula*, and *U. Scobina*, figured in Sylvanus Hanley's Supplement to Wood's Index. *U. Scobina* was subsequently published by Lea as *U. fluctiger*, without knowledge of its habitat.

2. *Unio pachysoma*, B., n. sp.

U. testa transverse ovato-elongata, inæquilaterali, tenuiuscula, valde tumida, antice brevi rotundata, postice breviter alata, demum modice acuminata, margine ventrali subrecto, postice ascendente; disco læviusculo, polito, transverse striatulo, postice dense striato; epidermide viridi, fasciis nonnullis luteis radiisque obscuris ornata, postice cærulescenti-viridi; umbonibus prominentibus versus apices contiguos minute radiato-costatis, carina umbonali prominente obtusa, linea secunda radiata interjacente; dentibus cardinalibus duplicibus, laminatis, lateralibus modice elongatis, valvæ sinistræ solum duplicibus: margarita pallide purpurea, interdum salmonis colore tincta.

Long. 23, lat. 44, diam. 21 mill.

Habitat in fluvio Berhampooter Assamensi.

Anterior cicatrices distinct, posterior confluent, dorsal ones under the cardinal teeth. The inner lamina of the latter in the left valve sometimes obsolete.

This is an inflated form of the *cæruleus* type, quite devoid of radiate rugæ on the slopes, and with an excavated posterior slope. The colour of the nacre is peculiar. I am indebted for the type to Colonel Jenkins.

A shell taken at Calcutta by Mr. W. Theobald, with a more elongate-cylindrical form, an olive-green epidermis, and a salmon-coloured nacre, and which I was at first disposed to consider to be a variety of *U. cæruleus*, seems to be a distorted variety of this species. A shallow shell, allied to the ordinary type of *U. cæruleus*, was sent to me from Assam by Major Rowlatt in abundance.

3. *Unio Theca*, B., n. sp.

U. testa transverse oblongo-ovata, valde inæquilaterali, tenui, compressa, antice et postice rotundata, superne subtusque convexiuscula, margine ventrali medio recto; disco subplanato, læviusculo, lineis transversalibus subrugosis versus margines notato; epidermide pallide stramineo-lutea; umbonibus planatis, decorticatis, versus apices tenues prominulos concentrice sulcatis, postice lineis duabus radiantibus tenuibus subelevatis munitis; ligamento lon-

giorie; dentibus cardinalibus laminatis, tenuibus, brevibus, utriusque valvæ duplicibus, valvæ dextræ prope marginem anteriorem sitis, obliquis; sinistræ lobo subapicali transverso, anteriore obliquo, lateralibus elongatis, vix curvatis, valvæ dextræ simplicibus, sinistræ duplicibus: margarita lutea, versus marginem ventralem albida.

Long. 20, lat. 40, diam. 10 mill.

Habitat in fluvio Cane, prope Banda, Bundelkhund.

Interior of shell transversely subplicate; cavity of beaks shallow. Anterior cicatrices separate, posterior confluent, apical ones in the cavity of the beaks. Some slight rugæ are visible on the posterior slope at right angles to the striæ of growth.

This shell, of which I found a single specimen, belongs to the *Corrianus* type of *Unio marginalis*, and is remarkable for its elongate-ovate non-rhomboidal form. *Unio marginalis*, although so abundant in other parts of the north-west, and occurring also in the upper part of the river Jumna, near Delhi, never was captured by me, in the branch of that river where I discovered this species, before 1830, and it has not appeared in any other collection made in the Gangetic region. The shell is somewhat wider posteriorly than anteriorly. The pale opake straw-colour of the unpolished epidermis is also a peculiar feature, not observable in any other Northern Indian species.

As in *U. bilineatus*, Lea, which occurs everywhere with *U. marginalis*, and which appears to me to be the young of that species, varying according to its varieties, the double umbonal line, apparent occasionally in adult specimens of *U. marginalis*, is conspicuous.

4. *Unio macilentus*, B., n. sp.

U. testa transverse rhomboideo-subovata, valde inæquilaterali, tenuiuscula, compressiuscula, antice rotundata, postice alata, recta, tum descendente, demum obtusa, margine ventrali convexiusculo; disco striato, medio radiato-rugoso, versus marginem transverse plicato; epidermide fuscata, versus marginem ventralem viridescente; umbonibus convexiusculis undato-sulcatis, decorticatis, ferrugineis, apice prominulo; ligamento elongato; linea umbonali convexiuscula; ala planiuscula, radiato-sulcata; dentibus cardinalibus brevibus, subverticalibus, duplicibus, erosis, lateralibus longiusculis rectis, valvæ sinistræ duplicibus: margarita versus marginem iridescente, versus apicem colore salmonis tincta.

Long. 24, lat. 42, diam. 15 mill.

Habitat in rivulo Choia Nuddy dicto, non procul a Bijnore, provinciæ Rohilkhund.

Anterior cicatrices separate, posterior confluent, apical in a row in the angle at the base of the cardinal tooth, the inner lobe of which in the right and the outer in the left valve are erect.

I took a single specimen of this shell in a hurried search at

the locality indicated. Although belonging to the *favidens* type with reference to its teeth, it approaches that of *cæruleus* in other respects. A delicate specimen which I got in the Gungun River, near Moradabad, appears to be a younger variety. Its next nearest Indian relation is a similarly radiate-sulcate compressed shell, taken by Dr. Bacon in Purneah and the Mahanuddy River, far to the eastward; but that form is narrower, has a shorter wing, is truncate posteriorly, and has the cardinal teeth (when not obsolete) more oblique, and the lateral teeth curved, approaching the Borneo species *Unio plicatulus*, Lea.

5. *Unio favidens*, B.

U. testa transverse ovata, inæquilateralis, crassa, subtumida, antice rotundata, postice subalata, declivi, angulata, demum obtusa, margine ventrali convexiusculo; disco inæqualiter sulcato; epidermide olivaceo-fusca, versus marginem ventralem luteo-olivacea, postice viridi parce fasciata; umbonibus tumidis, prominentibus, decorticatis, sulcis radiatis angulato-flexuosis indutis; lunula impressa, elliptica, decorticata; ligamento elongato; carina umbonali læviuscula, linea unica vix elevata notata; dentibus cardinalibus crassis, fortiter radiato-rugosis, lateralibus obliquis, elongatiusculis, valvæ dextræ duplicibus, sinistræ subtriplicibus: margarita pallide lutea, iridescente.

Long. 45, lat. 66, diam. 30 mill.

Habitat in fluvio Gange superiore.

The anterior and posterior cicatrices are distinct, the apical ones disposed on the under side of the cardinal tooth.

This fine shell, the type of the species, was taken by me in the Ganges at Bhitoura, between Cawnpore and Allahabad, in 1824, and the outline of it was figured in plate 7. fig. 1 of the 1st volume of 'Gleanings in Science' for 1829, from a private lithographic copy made in 1826, by Mr. Wood, from my rough sketch. The Bhitoura specimens were the largest which I captured during many years' residence in the country.

The following are the chief varieties of *U. favidens*. Some of them may possibly be regarded as separate species.

1. var. *marcens*. Banded with olive and green; nacre salmon-coloured; beaks nearly smooth, eroded; sulci obsolete, lunule narrow.

Long. 44, lat. 66, diam. 27 mill.

From the Berhampooter River, Assam. Colonel Jenkins.

2. var. *trigona*. Shell with a piceous epidermis, more oblique; beaks and nacre as in type; lunule broad. It shows an inclination to verge towards *U. triembolus*.

Long. 44, lat. 67, diam. 27 mill.

From Nujecabad, in the north-west of Rohilkhund.

3. var. *Delta*. Epidermis olive-green and yellow, rayed; nacre salmon-coloured; rugæ on umbones very distinct, some also on the upper part of the umbonal hinder slope; lunule somewhat broader than in the type; cardinal teeth narrower. Long. 34, lat. 47, diam. 24 mill.

I took a single specimen in the River Jellinghy, in 1831, in the upper part of the Gangetic Delta, Bengal.

4. var. *Chrysis*. Longer and less broad in proportion; epidermis a beautiful green, banded more or less with yellow; umbonal rugæ very strong and extended; cardinal teeth mostly narrower than in the type; nacre salmon-tinted. Long. 27, lat. 35, diam. 16 mill.

River Dojora at Kareily Ghát, near Bareilly. Single valves are long. 33, lat. 43 mill.

5. var. *viridula*. Form of type, but more compressed; colour as in the last; cardinal teeth broad; nacre bluish white; umbonal rugæ as in 4. Long. 27, lat. 40, diam. 17 mill.

Standing water, or "jheel," between Humeerpore and Someerpore, Bundelkhund.

6. var. *densa*. More solid and tumid; epidermis yellow-brown, eroded; lunule as in type; shell more oblique. Long. 33, lat. 47, diam. 24 mill.

Ganges River, above Chunár, between Allahabad and Benares.

Great confusion appears to exist with reference to the true *Unio corrugatus*. Lamarck describes it, including *U. rugosa*, Gm., as "ovato-rhombea, tenui," and the full-grown shell as "rounded rhomboid." Lea, in the third edition of his Synopsis, includes *U. corrugata*, *rugosa*, and *spuria*, Lk., as synonyms, and *nodosa*, with a mark of doubt. He also adds the solid *U. favidens*, Bens., with the very distinct and thick Tenasserim species *U. Tavoyensis*, Gould; but in vol. vii., in his remarks on *U. Nagporensis*, he alludes to *U. favidens* as a distinct species. A form allied to my var. *Delta* was supposed by Mr. Hanley to be the real type; and a Ceylon shell is also referred to it in Sir E. Tennent's List.

The winged young of *U. favidens*, 17 mill. in breadth, is thin and ovate-rhomboid; and the very young shell, which is more transverse, is angularly corrugate over the whole surface. The former approaches the figure of *Mya spuria* as copied by Wood.

A thin, compressed, rhomboid-ovate *Unio*, with radiate-sulcate beaks, found by Dr. Day on the Malabar coast, comes near Lamarck's description of his var. *rugosa*. It may possibly be the

Malabar *Mya radiata*, Ch. (not the American shell described by Lamarek and others), as there are traces of obsolete radiate striæ over the whole disk. It is 21 mill. long, 30 broad, and 12 mill. in diameter, and in form approaches the figure of *Mya radiata* in Wood's Index.

6. *Unio Smaragdites*, B., n. sp.

U. testa transverse ovato-rhomboidæa, inæquilaterali, crassiuscula, tumida, antice rotundata, postice alata, recta, tum valde declivi, demum subangulata, margine ventrali convexo; disco lævigato, polito, vix striatulo, sub epidermide pulchre viridi tenuissima obscure radiata albo, margine lutescente; umbonibus prominentibus, apicibus approximatis, subdecorticatis, margaritaceis, breviter et minute radiato-sulcatis; lunula angusta, elongata, transverse rugata; ligamento subelongato; carina umbonali prominente obtusiuscula, areola versus apicem depressiuscula, viridi obscure radiata; dentibus cardinalibus duplicibus, subangustis, rugosis, lateralibus curvatis elongatiusculis, valvæ dextræ simplicibus, sinistræ duplicibus, nonnunquam subtriplicibus: margarita albida, nonnunquam luteo tincta.

Long 31, lat. 42, diam. 20 mill.

Habitat in fluvio Berhampooter, regionis Assamensis.

Remarkable for the smoothness of the beautiful green epidermis, which is very thin, and, when rubbed off, exhibits a plain white colour, not nacreous, underneath. The anterior cicatrices are confluent, the posterior nearly distinct, the apical ones situated under the cardinal teeth. Cavity of beaks very deep; a few rugæ cross the striæ on the posterior slope. In general characters it approaches most nearly to the Jellinghy variety (*Deltæ*) of *U. favidens*, which has a more tumid ovate form, a regular, sulcate, olivaceous surface, longer and distinctly angulate-flexuous umbonal furrows, and a broad lunule.

I received this shell from Colonel Jenkins.

7. *Unio triembolus*, B., n. sp.

U. testa oblique rhomboidali, subtrigona, transversa, inæquilaterali, crassa, antice brevi rotundata, postice subalata, descendente, demum angulata, obtusa, margine ventrali convexo; disco transverse plicato et striato, piceo-nigrescente; umbone tumido, gibboso, versus apices remotos obtusos decorticatos iridescentes radiato-sulcato, carina umbonali obtusa; dentibus cardinalibus crassissimis, corrugatis, lateralibus obliquis, valva dextræ duplicibus, sinistræ triplicibus: margarita albida vel colore salmonis tincta.

Long. 47, lat. 57, diam. 27 mill.

„ 45, „ 62, „ 27 „

„ 44, „ 63, „ 30 „

Habitat in flumine Ramgunga, prope Moradabad.

Smaller varieties of the more trigonal as well as of the oblique

elongated form were taken by me in the River Goomty. I got a handsome variety of the first, with a green and olive epidermis, in the River Dojora, near Bareilly; and from the Gungut River, near Monghyr, in Bahar, a shell which may possibly be a gibbous variety of the second.

The anterior and posterior cicatrices are distinct, the latter particularly so; the apical cicatrices are indistinct on the inner side of the cardinal tooth; cavity of the beaks very deep and angular. In affinity the species appears to be connected on one side with the variety *trigona* of *U. favidens*, and, on the other, with *U. Rajahensis*, Lea.

The green Dojora variety is remarkable for the great development of the teeth. The lateral ones are disposed to be treble in the right as well as in the left valve; and several parallel plicæ intervene between them and the exaggerated cardinal teeth in a perfect specimen with the following dimensions:—

Lat. 50, long. 37, diam. 23 mill.

8. *Unio plagiosoma*, B., n. sp.

U. testa transverse trigono-ovata, inæquilaterali, crassiuscula, tumidiuscula, antice rotundata, postice subconvexe declivi, demum obtusa, margine ventrali convexiusculo; disco obsolete plicato, epidermide luteo-olivacea vel olivaceo-fusca; umbonibus convexis, prominentibus, decorticatis, angulatim flexuoso-sulcatis, apicibus prominentibus subremotis; ligamento brevi; carina umbonali obtusa; lunula elliptica; dentibus cardinalibus crassiusculis, radiatim eroso-sulcatis, lateralibus subelevatis, modice elongatis, obliquis, valvæ sinistræ duplicibus, dextræ simplicibus: margarita colore salmonis tincta.

Long. 26, lat. 39, diam. 18 mill.

„ 22, „ 32, „ 15 „

Habitat in flumine Cane, prope Banda, Bundelkhund.

The anterior cicatrices, as well as the posterior, are subconfluent, the apical ones situated on the under side of the cardinal teeth. The nacre is very iridescent posteriorly. A dark raised line borders the inner side of the umbonal slope, which exhibits a few rugæ at the upper part.

9. *Unio levirostris*, B., n. sp.

U. testa transverse oblonga, subovata, valde inæquilaterali, crassiuscula, medio subtumida, antice superne breviter angulata, deinde rotundata, postice superne sensim convexe descendente, demum rotundata, margine ventrali convexiusculo; disco læviusculo, concentricè leviter striato; epidermide olivaceo-viridi, fusco fasciata; umbonibus convexis, decorticatis, obsolete radiato-sulcatis, apicibus prominentibus, approximatis; lunula impressa, elliptica; ligamento elongato; dentibus cardinalibus brevibus, crassiusculis, eroso-

sulcatis, lateralibus subobliquis, elongatiusculis, rectis, utriusque valvæ duplicibus: margarita colore salmonis vix tincta.

Long. 28, lat. 50, diam. 20 mill.

Habitat in rivulis et stagnis prope Chunár.

This species was found by Capt. T. Hutton in tanks and streams near the Fort of Chunár, above Benares, and was noted as *Unio* No. 19, without name or description, in a paper contained in the fourth volume of the 'Journal of the Asiatic Society of Calcutta.'

It has two indistinctly raised dark rays on the posterior slope. The gradually compressed form of the hinder edge of the shell contrasts strongly with the inflated form of the central portion. Anterior and posterior cicatrices confluent, apical ones under the cardinal tooth. It belongs to the *favidens* type of Indian species, and is connected with the more oblique forms by the following species, *U. Pinax*, which is its representative in the more northerly and westerly tracts of the Gangetic region.

10. *Unio Pinax*, B., n. sp.

U. testa transverse oblonga, suboblique ovata, valde inæquilaterali, crassa, subinflata, antice rotundata, postice superne sensim descendente, demum obtusa, margine ventrali convexiusculo, postice vix emarginato; disco læviusculo, concentrice leviter striatulo, antice obsolete radiato-striato, versus marginem ventralem et posteriorem plicato; epidermide olivaceo-fusca; umbonibus convexis, decorticatis, obsolete radiato-sulcatis, apicibus prominentibus obtusis, remotiusculis; lunula elongato-elliptica; ligamento brevi; dentibus cardinalibus crassioribus, radiatim eroso-sulcatis, lateralibus obliquis, utriusque valvæ duplicibus, subflexuosis: margarita albidâ, iridescente.

Long. 30, lat. 48, diam. 21 mill.

Habitat in rivulo Gungun, prope Moradabad, Rohilkhund.

Anterior cicatrices subconfluent, posterior entirely so, apical ones under the cardinal tooth; cavity of the beaks very deep.

11. *Unio Leioma*, B., n. sp.

U. testa transverse oblonga, valde inæquilaterali, tenuiuscula, tumidi-
uscula, antice angustiore, rotundata, postice superne elevatiore
convexiuscula, demum subverticaliter truncata, margine ventrali
recto; disco transverse multisulcato; epidermide cinerascenti-
olivacea; umbonibus convexiusculis, decorticatis, erosis, apicibus
remotis; dentibus cardinalibus brevibus, laminatis, duplicibus,
lateralibus rectis breviusculis, valvæ sinistræ solum duplicibus:
margarita lactea, vix aurantiaco tincta.

Long. 23, lat. 50, diam. 17 mill.

Habitat in regione Dekhan? prope Bombay.

The subapical tooth of the left valve is lengthened and in-

clined to be obsolete, the outer one is short, thin, and prominent; those of the right valve are divaricate, the outer one thin, and the inner thicker, erose, and prominent at the end. The anterior cicatrices are distinct, the posterior confluent, the apical ones run under the inner cardinal tooth. The cavity of the beaks is shallow. There are slight indications of rugæ on the posterior slope. The valves are open posteriorly. The elevated portion of the posterior slope is broad and flattened. It has considerable resemblance in form to *U. navigioliformis*, Lea, but is more perpendicularly truncate posteriorly, has very different teeth, and the lateral ones are shorter in comparison. It differs altogether from *U. Shurtleffianus*, Lea, from the Dekhan, in its very transverse form, the position of the beaks, and the colour of the epidermis.

This pod-shaped species is very distinct from all the shells of the *cæruleus* type, both in form and surface. I mislaid my note of its habitat; but, from various circumstances, I have reason to believe that it was sent to me by Dr. Jerdon from the Dekhan.

12. *Unio crispisulcatus*, B., n. sp.

U. testa transverse subovata, subinæquilaterali, antice rotundata, postice superne descendente, leviter angulata, demum obtuse angulata, crassiuscula, compressiuscula; disco convexiusculo, minutissime radiatim rugoso-costulato, costulis nonnullis acute divaricatis, posterioribus latioribus; umbonibus prominentibus, contiguis, apicibus acutiusculis; epidermide luteo-olivacea, postice fuscata, hic illic nonnunquam viridescente; dentibus cardinalibus utriusque valvæ duplicibus, lamellatis, lateralibus obliquis, modice elongatis, valvæ sinistræ duplicibus: margarita cæruleo-albida, iridescente.

Long. 28, lat. 45, diam. 16 mill.

Habitat in rivulo Bangong, prope Thyet-Myo, regionis Burmanicæ. Collegit W. Theobald.

The anterior cicatrices are distinct, the posterior confluent, the apical ones above the moderate angular cavity, and running under the cardinal tooth.

The delicate sculpture over the whole disk of this shell is peculiar. In form it does not approach any Gangetic type.

13. *Unio Pugio*, B., n. sp.

U. testa transverse elongato-triangulari, linguæformi, valde inæquilaterali, compressiuscula, crassa, antice brevissima, subito descendente rotundata, postice sensim angustiore, cuneiformi, demum acuminata, margine dorsali recto, ventrali convexiusculo, postice ascendente; umbonibus late planatis, lævibus, prominentibus, carina umbonali subito obtuse angulata, area interjacente versus cardinem descendente; disco subplanulato, læviusculo, substriato;

dente cardinali (valvæ dextræ) brevi, crassa, prominente, radiato-sulcata, laterali elongata, subduplicata, intus crenulata: margarita albida, iridescente.

Long. 21, lat. 42, diam. 16 mill.

Habitat in regione Ava.

The anterior cicatrices are distinct, the larger deeply excavated under the cardinal tooth, the smaller punctiform, posterior ones confluent. Cavity of the beaks very shallow. Dorsal cicatrix under the cardinal tooth. The cardinal ligament is lengthened. The single right valve sent for examination by Mr. Theobald is decorticate and worn.

The Chinese lengthened lanceolate *Unio Grayanus*, Lea, and the Siamese *U. sagittarius*, Lea, are allies of this shell in regard to form; but the thick prominent cardinal tooth, and the exceedingly short anterior portion of the shell suddenly deflected from the beak, are sufficient characters for the recognition of the species, independently of other differences. It is also more narrow at the posterior end than *U. sagittarius*. The angle of the umbonal slope, with the area intermediate between the slope and the hinge, and descending to the latter, are also peculiar features.

The only allied species which exhibits a similarly short anterior portion of the shell is *U. truncatus*, Swains., in which, however, it forms an intermediate sinus, instead of descending suddenly and directly as in *U. Pugio*. There is also something in the general form connecting the two shells; but Swainson's species is tumid, not flattened, has a more prominent umbo, and is not so narrow posteriorly, while the peculiar angle and cardinal descent of the umbonal slope afford additional characters for separating *U. Pugio* from the rare shell, of unknown locality, in Mrs. Mawe's cabinet.

The habitat of *Unio Nuttallianus*, Lea, is merely announced as Indian by the author. I received specimens from Major Rowlett from Assam, where, with the thin, tumid, and peculiarly formed *U. involutus*, nobis, it represents the thin and compressed Gangetic species, *U. olivarius*, Lea, some specimens of which, from the rivers Jumna and Dojora, approach it in the more angular form of the posterior end. The epidermis varies from a fine green to olive, and the salmon-colour of the nacre is occasionally very rich. The beaks exhibit slight nodules in rayed lines; and coloured rays are also visible on the epidermis. It attains the following dimensions:—long. 25, lat. 40, diam. 18 mill.

My largest specimens of a variety of *Unio olivarius*, Lea, taken in the River Ramgunga, above Moradabad, are 50 mill. in breadth by 28 in length, and 16 in diameter. It is widely distributed in the Gangetic region, and is most abundant in the

Rohilkhund streams,—the Ramgunga, Dojora, and Gurrah. It prefers sand-banks to mud, and is frequent in pools left by the falling waters. I have taken it also in the Jumna, Ganges, Bhaghiratty, and Goomty. It varies in colour from pale green to bluish green and olive.

The Assam species *Unio Corbis*, nobis, attains the size here recorded. With the exception of one small specimen, my examples are odd valves.

Long. 21, lat. 32, diam. 18 mill.

Another distinct species, of which I have a single valve, received from Major Rowlett, inhabits Assam.

Unio bilineatus, Lea, I consider, as stated above, to be the very young of *U. marginalis*, Lk. Wherever the numerous varieties of the latter shell are found, from Delhi and Rohilkhund to Calcutta, the *bilineatus* form accompanies it, gradually altering, as the shell increases in size, into the regular type. The most beautiful variety of *Unio marginalis*, with a thicker shell and teeth, and with a fine salmon-coloured nacre, occurs in the Ramgunga, near Moradabad. At Calcutta, the species varies considerably in form, even in the same water. A salmon-nacred shell, sent by Dr. Day from Cochin, on the Malabar coast, apparently identical with the Chinese *U. consobrinus*, Lea, has the same form of young. In fact, the young of several species of *Unio*, of the *favidens* and *cæruleus* types, are disposed to be straight-hinged, as well as that of Gould's *U. Tavoyensis*, which closely approaches the young Siamese shell described by Lea as *U. Nucleus*.

P.S. *U. crispisulcatus*.—The sculpture is very like that of *Mya rugosa*, as figured by Chemnitz, t. 170. f. 1649; but the form of the posterior portion of the shell differs from that of the Coromandel species. The cardinal teeth are altogether different from those of the figure of "*rugosa*" in the 'Encyclopédie,' pl. 248. f. 6.

Cheltenham, Aug. 7, 1862.

XX.—Notes on some Chinese Condiments obtained from the Xanthoxylaceæ. By W. F. DANIELL, M.D., F.L.S., Staff-Surgeon, Army Medical Staff, &c.

[Plate V.]

I. *Chinese or Japanese Pepper* (*Xanthoxylum piperitum*, DC.).

AMONG other articles of food vended in the grocers' shops of the various provinces of the Chinese empire, may be enumerated collections of small dried fruits, consisting of dehiscent capsules